



**PUBLIC SERVICES AND PROCUREMENT CANADA**

# **Spill Prevention and Response Plan Isachsen High Arctic Weather Station (HAWS), Nunavut**

**Prepared for Public Services and Procurement Canada on behalf  
of Environment and Climate Change Canada (ECCC)**

**DFRP #: 07527**

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**Draft Report Revision 1**



Operations Building



Waste Fuel Drums

July 14, 2025

Environmental Services and Contaminated Management  
Public Services and Procurement Canada  
9700 Jasper Ave NW, Suite 1000  
Edmonton, Alberta T5J 4C3

Attention: Mr. Michael Brownlee  
Senior Environmental Specialist

Dear Mr. Brownlee:

Nuqsana-Outcome Joint Venture (NOJV) is pleased to provide Public Services and Procurement Canada (PSPC) with the attached Spill Prevention and Response Plan for Environment and Climate Change Canada's (ECCC's) Isachsen High Arctic Weather Station (HAWS) in Nunavut.

Should you have any further questions or comments, please contact the undersigned at your convenience.

Yours truly,

**NUQSANA-OUTCOME JOINT VENTURE**



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Senior Environmental Project Manager



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Our File: P2025-05

Public Services and Procurement Canada

*Spill Prevention and Response Plan, Isachsen HAWS, NU*

July 2025

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## Glossary and Acronyms

| Acronym     | Definition                                        |
|-------------|---------------------------------------------------|
| CARD        | Contaminants and Remediation Division             |
| ECCC        | Environment and Climate Change Canada             |
| EHS         | Environment, Health and Safety                    |
| EMT         | Emergency Medical Technician                      |
| GNWT        | Government of the Northwest Territory             |
| NAO         | Northern Affairs Organization                     |
| NCSP        | Northern Contaminated Sites Program               |
| NWB         | Nunavut Water Board                               |
| PSPC        | Public Services and Procurement Canada            |
| the Plan    | Spill Prevention and Response Plan                |
| the Project | Isachsen High Arctic Weather Station Incineration |
| SCBA        | Self-Contained Breathing Apparatus                |
| MSDS        | Material Safety Data Sheets                       |

## Executive Summary

---

Nuqsana and Outcome Consultants in joint venture (Nuqsana-Outcome or NOJV) have completed a Spill Prevention and Response Plan (“the Plan”) for the waste fuel Incineration project at the Isachsen High Arctic Weather Station (“the Project”) in Nunavut (“the Site”). This Plan is a component of the scope of work included in NOJV’s mandate for the 2025-2026 waste fuel incineration at the Isachsen High Arctic Weather Station.

The purpose of this Plan is to define procedures and practices that will minimize the likelihood of spills occurring and reduce the impact to ground and hence to surface water of any spills that do occur during the Project.

The scope of the Plan includes all work that will be completed and all work areas included in the Project. Spilled fuel can travel and affect sensitive receiving environments, with the potential for ecological harm requiring extensive clean-up. The goal is to prevent spills using best management practices and spill containment equipment.

The Plan set out how spills will be managed during the incineration works including:

- Response actions for potential spills of any size, including a worst-case scenario.
- Key response personnel and their roles and responsibilities in the event of a spill.
- Equipment and other resources that will be available to respond to a spill.
- Spill response procedures that will minimize potential health and safety hazards, environmental damage.

Spill contingency measures are set out in the Plan. These include specific information for the assessment of potential impacts, the installation of specific control measures such as spill kits, booms, and the monitoring and reporting of the effectiveness of these control measures.

## 1.0

# Introduction

## 1.1

## Introduction

This Spill Prevention and Response Plan (“the Plan”) applies to the waste fuel incineration project (“the Project”) being undertaken as part of remediation work being carried out at the Isachsen High Arctic Weather Station (HAWS) in Nunavut (“the Site”). This work is being carried out for Public Services and Procurement Canada (PSPC) under the Standing Offer Agreement #EW699-220414/011/NCS, project number R.125553.001 on behalf of Environment and Climate Change Canada (“ECCC” or “Custodian”). This Plan is being submitted in addition to the Waste Fuel Reduction Plan as per the requirements of the Type “A” Land Use Permit application.

Table 1 provides key project information relating to the project.

**Table 1: Key Information related to the Project**

|                           |                                                                                                                                                                     |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Name and Location | Waste Fuel Incineration at the Isachsen High Arctic Weather Station, NU                                                                                             |
| Contracting Authority     | Public Services and Procurement Canada (PSPC)<br>Northern Contaminated Sites Program, Western Region<br>9700 Jasper Ave NW, Suite 1000<br>Edmonton, Alberta T5J 4C3 |
| Contact                   | Michael Brownlee (PSPC)<br>Project Manager<br>Michael.Brownlee@tpsgc-pwgsc.gc.ca<br>Cell: 780-720-7748                                                              |
| Consultant                | NOJV                                                                                                                                                                |
| Contractor Information    | Keelan Veitch, Project Manager, <a href="mailto:kveitch@outcomeinc.ca">kveitch@outcomeinc.ca</a> , 613-297-0341 (cell)                                              |
| Consultant Address        | 200-151 Holland Ave.<br>Ottawa, Ontario, K1Y 0Y2                                                                                                                    |

## 1.2

## Purpose and Scope

The purpose of this Plan is to describe the practices which will be implemented to prevent spills from occurring and to define the response actions for spills of any size, should they occur, including a worst-case scenario. The Plan identifies key response personnel and their roles and responsibilities in the

event of a spill, as well as the equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards and environmental damage, and guide the clean-up efforts. The Plan has been prepared to ensure quick access to all the information required in responding to a spill. The scope of the Plan includes all work to be completed in the Project and covers all work areas as part of the project.

Standard Operating Procedures relating to this Plan are included in Appendix A.

### 1.3 Roles and Responsibilities

Table 2 outlines the roles and responsibilities of people working on the site with respect to the management of the risk posed by potential spills on site.

**Table 2: Roles and Responsibilities**

| Role                         | Responsibility                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consultant<br>NOJV           | Oversee spill contingency measures including transfer of waste fuels, fuel incinerator operations on site and ensure the necessary resources are available to implement fuel transfer tasks.                                                                                                                                                              |
| Site Supervisor from<br>NOJV | Ensure the necessary resources are available to implement this Plan in tandem with ATCO.                                                                                                                                                                                                                                                                  |
|                              | Ensure that monitoring inspections are conducted throughout the day and at the beginning and end of every workday.                                                                                                                                                                                                                                        |
|                              | Consult with the NOJV Project Manager and ATCO for mitigation measures in response to potential issues.                                                                                                                                                                                                                                                   |
|                              | Maintain communications with the NOJV Project Manager to ensure monitoring and responses are appropriate.                                                                                                                                                                                                                                                 |
| Subcontractor<br>ATCO        | <p>Company hired with appropriately ticketed trades-people (oil burning mechanics) to execute the Project using a combination of owned and site available equipment.</p> <p>Ensure the necessary resources are available to implement this Plan.</p> <p>Implement and supervise the work at the designated Incineration area as set out in this Plan.</p> |

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Employees of consultant and subcontractor | Follow the requirements set out in this Plan. |
|-------------------------------------------|-----------------------------------------------|

Employees and subcontractors will be trained on the spill contingency measures outlined in this Plan and will be responsible for actioning the Plan in the event of a spill under instruction of the Site Supervisor.

Visitors to the site who are not either employed by the consultant (NOJV) or the subcontractor (ATCO) or the owner (Government of Canada) will not have any involvement with the Project.

## 1.4 Contact Information

An immediately reportable spill is defined as a release of a substance that is likely to be an imminent environmental or human health hazard or meets or exceeds the volumes shown in the attached table. These spills must be reported to the Government of Northwest Territories (GNWT) 24-hour Spill Report Line at (867) 920-8130. Table 3 provides key contact information relating to the project

**Table 3: Key Contacts**

| Name                        | Position                                 | Contact #                                                                                                                                                                           |
|-----------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Keelan Veitch               | Project Manager, Site Supervisor         | <a href="mailto:keelan@outcomeinc.ca">keelan@outcomeinc.ca</a><br>Cell: 613-297-0341                                                                                                |
| Don Plenderleith            | Project Director, Site Supervisor        | <a href="mailto:dplenderleith@outcomeinc.ca">dplenderleith@outcomeinc.ca</a><br>Cell 613-880-3352                                                                                   |
| Eric Grimminck              | Site Supervisor                          | <a href="mailto:egrimminck@outcomeinc.ca">egrimminck@outcomeinc.ca</a><br>Cell: 905-802-3609                                                                                        |
| Michael Brownlee            | PSPC Project Manager (Assessment)        | <a href="mailto:Michael.Brownlee@tpsgc-pwgsc.gc.ca">Michael.Brownlee@tpsgc-pwgsc.gc.ca</a><br>Cell: 780-720-7748                                                                    |
| Ryan Breivik                | PSPC Project Manager (Remediation)       | <a href="mailto:Ryan.Breivik@tpsgc-pwgsc.gc.ca">Ryan.Breivik@tpsgc-pwgsc.gc.ca</a><br>Cell: 905-691-1574                                                                            |
| Owen Wade                   | ECCC Project Manager                     | <a href="mailto:owen.wade@ec.gc.ca">owen.wade@ec.gc.ca</a><br>Cell: 613-981-8652                                                                                                    |
| Malcolm McLean              | Discovery Mining Services – Camp Manager | <a href="mailto:malcolm.mclean@discoverymining.ca">malcolm.mclean@discoverymining.ca</a><br>Cell: 867-445-1642                                                                      |
| Chris Coventry / Front Desk | ATCO – Resolute Operations               | <a href="mailto:Chris.Coventry@atco.com">Chris.Coventry@atco.com</a><br>Cell: 867-686-0594<br><a href="mailto:frontdesk.res@atco.com">frontdesk.res@atco.com</a><br>or 867-252-3737 |

| Name       | Position                 | Contact #                                                                          |
|------------|--------------------------|------------------------------------------------------------------------------------|
| Guy Dorion | ATCO Heavy Duty Mechanic | <a href="mailto:Guy.Dorion@atco.com">Guy.Dorion@atco.com</a><br>Cell: 418-951-4493 |

External resources for assistance in the event of a spill are listed in Table 4. Assistance from outside the community may not be able to reach the site until at least the next business day.

**Table 4: External Resources**

| Contact                                            | Phone                                                    |
|----------------------------------------------------|----------------------------------------------------------|
| RB Airport Manager (Nunavut Gov't)                 | Office: 867-252-3923                                     |
| Steve Piercy, Hamlet Senior Administrative Officer | 867 252 3616                                             |
| Resolute Bay Health Centre                         | (867) 252-3844                                           |
| Qikiqtani General Hospital (Iqaluit)               | (867) 975-8600                                           |
| 24-Hour National Spill Response Hotline            | 1-800-663-3456                                           |
| WSCC 24-Hour Emergency Contact                     | 800-661-0792                                             |
| Transport Canada Emergency Response                | 1-800-889-8852                                           |
| NT-NU 24-Hour Spill Line                           | 867-920-8130                                             |
| GNWT ENR Wildlands Fire                            | 877-698-8473                                             |
| GNU Fire Marshall Emergency                        | 867-979-6262                                             |
| GNU Department of Environment, Wildlife Office     | 867-982-7450                                             |
| Coast Guard                                        | 1-800-267-7270                                           |
| RCMP – Resolute Bay                                | 867-252-1111 (emergency)<br>867-252-0123 (non-emergency) |
| Poison Control                                     | 867-669-4100                                             |
| Forest Fire Emergency                              | 877-698-3473                                             |

## 1.5 Plan Development

This Plan has been developed in accordance with the following Water Board guidance documents:

- Guide to the Land Use Permitting Process (MVLWB, 2021a).
- Standard Outline for Management Plans (MVLWB, 2021b).
- Spill Contingency Planning and Reporting Regulations (Government of Nunavut, 2023).

This Plan is effective as of the date of submission and will be adhered to once accepted and finalized. This Plan is a living document additional reviews as warranted may be carried out to reflect changes in operations, technology, chemicals, or fuels, or as directed by the NWB. Any revisions to the Plan will be submitted to the NWB for review and approval. ATCO and NOJV endeavors to take every reasonable precaution toward ensuring the protection and conservation of the natural environment, the safety and health of the employees and (protecting) the community (at large) from any harmful effects of its materials and operations. It should be noted that this Plan is not expected to relate to any other territorial or local community Plan as the project site is remote.

## 1.6 Environmental, Health and Safety Policy

NOJV's Health and Safety Plan (NOJV 2025) sets out the health and safety procedure that apply to the Project.

## 1.7 Training

Employees and subcontractors will be trained on the spill contingency measures outlined in this Plan. Employees will also be required to be trained on any safe work procedures associated with spill prevention and response planning. Visitors to the site will be provided with an induction on any specific spill contingency plans relevant to their work. The training program will be developed by NOJV and includes the following key steps:

- All individuals who will access the site will be required to participate in an on-site orientation session. The training will be conducted on an as needed basis for personnel of the consultant or subcontractor entering the site to work on the Project. A hard copy of this Plan and spill kit locations will be kept at the camp in a field procedures binder.
- Specific training, including mock demonstration of spill exercises, for individuals directly involved in handling fuel to ensure they know all steps to be undertaken in handling these materials, as well as the steps involved in the event of a spill or discovered leaking drum, including the proper use of spill kits. This training will be completed within the first week of arrival on site for all individuals.
- All employees and contractors will be required to have their WHMIS training before working on the site.

- Supervisors will be required to have first aid training and an appropriate number of workers will also have first aid training as per the NWT Safety Act.
- In the event of medical and trauma emergencies Discovery Mining Services's Richard Shushack will be the primary First Aider with NOJV individuals as a secondary precaution in responds to emergencies at a pre-hospital setting ("infield") for the purpose of stabilizing a patient's condition before and during transportation to an appropriate medical facility.
- The Site Supervisor or designate will maintain a record of trained individuals and document training dates via the daily report for all personnel entering the site. Depending on the type of work to be conducted, each person will have specific training requirements. Future training requirements will be estimated for planning purposes to avoid potential delays cause by retraining in the overall work schedule.
- Records of will be kept electronically and on-site, and will be provided to appropriate parties as needed. Applicable training will be completed prior to the commencement of work. Training and competency will be reviewed regularly, and refresher training will be provided as required.

## 1.8 List of Waste Fuels on Site

Table 5 provides an inventory of waste fuel that is included in the Project on site, the type of storage containers, normal and maximum quantities stored and their storage location.

**Table 5. Waste Fuel Inventory Subject to the Incineration Plan**

| <b>Table of Hazardous Materials</b>                                   | <b>Number of Containers</b> | <b>Capacity of Container</b>                   | <b>Quantity of fuel on site</b> | <b>Proposed Storage or Staging Location*</b>                                              |
|-----------------------------------------------------------------------|-----------------------------|------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------|
| Diesel                                                                | 27 Drums<br>14 ASTs         | 205 L drums<br>(and large tanks)               | 52,224 L                        | Various Drums<br>and large AST<br>tanks                                                   |
| Gasoline                                                              | 71                          | 205 L drums                                    | 4,665L                          | Various Drums                                                                             |
| Aviation Fuel<br>(Includes Jet A,<br>Jet B, Jet N/A,<br>and Kerosene) | 183                         | 205 L drums                                    | 14,450 L                        | Various Drums                                                                             |
| Hydraulic oil,<br>lubricating oil                                     | 13                          | 205 L drums                                    | 955 L                           | New Garage (to<br>be stored for<br>future removal)                                        |
| Antifreeze                                                            | 1                           | 205 L drums<br>(once removed<br>from vehicles) | 40 L                            | In Abandoned<br>Vehicles near<br>New Garage (to<br>be stored for<br>future removal)       |
| Wastewater                                                            | TBD                         | 205 L drums                                    | ~5,302 L                        | Transferred<br>back into<br>emptied 205L<br>drums (to be<br>stored for<br>future removal) |

## 1.9

**Distribution and Storage of Management Plan**

This Plan will be distributed to:

- NOJV staff and all subcontractors
- PSPC
- ATCO
- Other applicable parties

A physical copy of this Plan will be kept on site in the camp's main office.

## 2.0

## Site Description

The Isachsen HAWS has a total area of approximately 450 hectares (ha) and is centered at a latitude of 78° 46' 40" N and longitude of 103° 31' 40" W facing Louise Bay, on the west-facing side of Ellef Ringnes Island, NU. The federal land reserve is occupied by approximately 22 permanent structures with associated infrastructure, equipment, and supplies. Other features previously identified at the Site, in addition to the 22 structures, include a 1,500-metre-long runway, former water and sewage infrastructure, fuel storage and distribution facilities, power generation equipment, two on-site waste disposal areas (WDAs), fuels tanks, thousands of empty/partially empty drums, other abandoned equipment, and debris. **Figure 1 (Appendix A)** presents the Site Location.

The supplies for constructing the initial buildings and grading of the runway at Isachsen were mobilized by air and deposited on sea ice between April 3 and 21, 1947. The station operated as one of five Joint (Canadian and American) High Arctic Weather Stations for the purpose of measuring meteorological information and relaying it to weather analysts in the south. One of the weather measurement activities consisted of filling and releasing hydrogen-filled balloons and tracking their movement. The United States left this partnership in 1972. Canada maintained a staffed operation at Isachsen under Transport Canada until 1975 and under Environment Canada until September 1978 when the staffed station was closed.

Since 1978, the weather data collection facilities at Isachsen have been automated and there has been no permanent staff at Isachsen, however the facilities at the Site have been used to support numerous scientific research groups, and for hosting exercises by the Canadian Rangers. The Meteorological Services of Canada Bureau (MSCB) operates an automated weather station at Isachsen which is available at: Isachsen - Past 24-Hour Conditions - Environment Canada ([weather.gc.ca](http://weather.gc.ca)).

Access to Isachsen for building materials, equipment and personnel has been exclusively by air including documented access by large transport aircraft (L-382 Hercules) in the past. The only exception to aircraft access to Isachsen occurred in 1995 when it was reached by cat train over ice by a remediation contractor. There is no record of it having been reached by sea and after multiple inquiries, the only service providers of the region Nunavut Eastern Arctic Shipping Group (NEAS) and Nunavut Sealink and Supply Inc (NSSI) indicated that it could not be reached by sealift.

Waste clean-up efforts began in 1996 with drum crushing, fuel incineration and burial of derelict heavy equipment in the West Gully Landfill, but very muddy conditions made the job very difficult.

The Site has been the subject of numerous studies since 1996. Dillon-Outcome Joint Venture (DOJV) completed a Phase III Environmental Site Assessment (ESA) in the 2022 field season (DOJV Phase III ESA, 2023) as well as a Human Health and Ecological Risk Assessment (HHERA) (DOJV, 2023). A Hazardous Building Materials Assessment, Data Gap Analysis and Remedial Options Analysis (ROA) were also

produced in 2023 to further define the required remediation work scopes and preferred approach to dealing with existing waste streams.

NOJV continued remedial design and planning in 2024-2025 with the completion of an Archaeological Impact Assessment, Permitting Requirement and Application Roadmap, Lead Abatement Options Analysis, Fuel Reduction Plan, Borrow Pit Development Plan, Building Demolition and Solid Waste Management Plan, Community Engagement Plan, Permafrost Monitoring and Climate Change Vulnerability Assessment, Environmental Impact Assessment, and Field Summary.

## 3.0

## Spill Prevention

The primary objective during fuel handling for the Project will always be to take actions to prevent spills from occurring. The effort taken in preventing spills, is easier, quicker and less costly than remediating a spill by a factor of 10 to 100. This will be front of mind throughout the Project.

## 3.1

### Preventative Measures

During the Project, approximately 76,200L of waste fuel will be handled and transferred to the incineration area for burning. The following prevention measures will be implemented during loading, transport and unloading of waste fuel:

- Fuel transfer will always be directed and undertaken by a trained ATCO Trade in a manner that prevents uncontrolled release of fuels.
- Fuel drums along the runway will be assessed for integrity before being moved in the slightest way.
  - If drums appear weak or damaged and are on their side, they will be gently rolled onto a portable berm with their main bung at the high point (12 o'clock position). The bung will be opened, and the fuel will be pumped into a 1,000 L mobile tote secured on the loader.
  - If they are up-right, they will have their bung removed and the fuel will be pumped into a 1,000 L tote secured on the loader.
- The loader will take the 1,000 L mobile tote and drive it to the incineration area and place it within a spill berm of 110% capacity of the tote.
- Fuel will be transferred from the mobile tote to into a fuel mixing tanks via pumps situated in the spill berm.
- The fuel mixing tanks for incineration will be stored within contained spill berms having a 110% or greater volume then the tanks themselves.
- The loading and unloading zones will have rig matting to prevent rutting the softer soils.
- Portable spill berms will be used underneath IBC totes/tanks while transferring fuels.
- Shovels and pails will be available for removing small spills and soil at the source. Contaminated soil will be kept in a berm.
- Spill containment berms will be checked daily for damage or wear.
- Drums will not be removed or reorganized until they have been emptied.
- Transport of fuels will be undertaken in a regulated IBC tote/tank for transfer of and secured with secondary and tertiary measures to ensure secure transport.
- Spill kits will be available at the point of transfer and at the designated incineration area in case of a spills.

The following actions illustrate the proactive approach for to environmental protection and spill prevention. These actions minimize the potential for spills during fuel handling, transfer, and storage:

1. Fuel transfer hoses will be wiped down immediately after fuel transfer.
2. Operators will carefully monitor fuel volume in all receiving vessels during transfer.
3. Clean-up of drips and minor spills will be carried out immediately with equipment/materials provided in all spill kits.
4. Drums, tanks, and hoses will be inspected regularly for leaks or potential to leak.
5. All personnel, especially equipment operators, will be trained in proper fuel handling and spill response procedures.

## 4.0

## Spill Response

NOJV will be equipped to respond to potential spills on site. See Spill Materials Inventory (Section 7) below.

## 4.1

### Summary Process

In the event of a spill, the following is the process to be followed:

1. Spill or release is identified
  - a) Assess personal safety and safety of others
  - b) Stop flow of spill if safe to do so
  - c) Identify spilled material if it is safe to do so
2. Notify Site Supervisor who will
  - a. Notify PSPC and ECCC Department Representative
  - b. Notify both Federal and NU Spill Inspectors
  - c. Notify NU spill line, if required
3. Implement Spill response as outline in this Plan
  - a. Contain spill
  - b. Clean up spill
4. Record spill, actions taken and outcomes.

## 4.2

### Spill Reporting Procedures

Spills will be reported immediately to the Site Supervisor, who will notify the NOJV Project Manager, PSPC and ECCC. Together they will determine if the spill is to be reported to the NU 24-Hour Spill Line at 867- 920-8130, based on the reportable quantities for spills in NU (Table 6). Copies of the NU Spill Report form, and the list of contacts will also be available in each spill kit and in Appendix C at the end of this document. The form will be filled out by the Site Supervisor (or designate) and faxed or emailed to the NWT 24-Hour Spill Report Line.

**Table 6. Reportable Quantities for Spills in Nunavut**

| Substance                                                                                                                                                                 | Reportable Quantity                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Explosives Compressed gas (toxic/corrosive)<br>Infectious substances<br>Sewage and Wastewater (unless otherwise authorized)<br>Radioactive materials<br>Unknown substance | Any amount                                                          |
| Compressed gas (Flammable)<br>Compressed gas (non-corrosive, non-flammable)                                                                                               | Any amount of gas from containers with a capacity greater than 100L |

| Substance                                                                                                                                                                                                                                                                                                             | Reportable Quantity                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Flammable liquid                                                                                                                                                                                                                                                                                                      | ≥100 L                                                                              |
| Flammable solid<br>Substances liable to spontaneous combustion<br>Water reactant substances                                                                                                                                                                                                                           | ≥ 25 kg                                                                             |
| Oxidizing substances                                                                                                                                                                                                                                                                                                  | ≥ 50 L or 50 kg                                                                     |
| Organic peroxides<br>Environmentally hazardous substances intended for disposal                                                                                                                                                                                                                                       | ≥1 L or 1 kg                                                                        |
| Toxic substances                                                                                                                                                                                                                                                                                                      | ≥ 5 L or 5 kg                                                                       |
| Corrosive substances<br>Miscellaneous products, substances, or organisms                                                                                                                                                                                                                                              | ≥ 5 L or 5 kg                                                                       |
| PCB mixtures of 5 or more ppm                                                                                                                                                                                                                                                                                         | ≥ 0.5 L or 0.5 kg                                                                   |
| Other contaminants--for example, crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater.                                                                                                                                                                  | ≥ 100 L or 100 kg                                                                   |
| Sour natural gas (i.e., contains H <sub>2</sub> S)<br>Sweet natural gas                                                                                                                                                                                                                                               | Uncontrolled release or sustained flow of 10 minutes or more                        |
| Flammable liquid<br>Vehicle fluid                                                                                                                                                                                                                                                                                     | ≥ 20 L When released on a frozen water body that is being used as a working surface |
| Reported releases or potential releases of any size that:<br>1. Are near or in an open water body,<br>2. Are near or in a designated sensitive environment or habitat,<br>3. Pose an imminent threat to human health or safety, or<br>4. Pose an imminent threat to a listed species at risk or its critical habitat. | Any amount                                                                          |

### 4.3 Spill Documentation

Throughout the spill response process, it is important to record relevant information for reporting purposes. Blank copies of the NWT/Nunavut Spill Report form are included in **Appendix D**. The following list includes items that should be recorded by the Site Supervisor, or their designate:

- The date, time, and location of the release.
- The weather at the time of the release and during the response phase.
- The cause of the release.
- The type and estimated quantity of substance(s) involved.

- The type of containment and clean-up techniques used.
- The affected environment and/or properties.
- The parties and/or individuals involved in the response.
- The parties and/or individuals exposed to the substance(s) involved.
- Health and safety concerns.
- Disposal methods used, including quantities and locations.
- Site remediation completed and planned.
- Short and long-term environmental impacts.
- A status of response.
- A log of response action taken including associated times.
- Measures to be implemented to prevent reoccurrence of the incident.

## 4.4

## Procedures for the Protection of Human Health and Safety

Following a spill, the health and safety of workers as well as the public is a priority. Actions taken will depend on the type of spill.

- In the event of a flammable or combustible material spill: Disconnect electrical equipment, evacuate immediate area, and restrict access to the spill area. Only spark-arresting equipment should be used during clean-up of the spill. PPE should also be worn by workers involved in the clean-up.
- Procedures for containing and controlling spills general procedures noted below will be used to contain and control all spills. Specific procedures for spills on land, water, snow, and ice follow.
- First anticipate what will be affected by the spill.
- Assess direction and speed of spill, and any factors that could affect these (water, wind, and slope).
- Determine best location for containing spill, avoiding any water bodies

## 5.0 Action Plan

### 5.1 Summary

This section outlines the procedures and steps that would occur in the event of a spill or unauthorized discharge. In all cases, environmental monitoring is a vital and extremely important aspect of any spill or unauthorized discharge. It ensures that the emergency response team has acted correctly and that the action plan has been effective. Sampling of liquid, soil, and vegetation from any seepage or spill area is required to determine contaminant levels, if any. Once a spill is stopped and/or contained, the spill area will be monitored on a regular basis until results demonstrate that levels are below prescribed limits. The Site Supervisor will tabulate results and prepare a detailed spill report within thirty (30) days of any spill. The Site Supervisor will submit the detailed spill report including descriptions of root causes, response actions, etc. to The Government of Nunavut Land Administration.

In the case of any spill or other environmental emergency, it is necessary to react in the most immediate, safe, and environmentally responsible manner. No spill or incident is so minor that it can be ignored.

### 5.2 Procedures for Initial Actions

The basic steps of the response plan are as follows:

1. Always ensure the safety of all persons.
2. Identify and find the spill substance and its source, and, if possible, stop the process or shut off the source.
3. Inform the immediate supervisor or his/her designate at once, so that he/she may take appropriate action. Appropriate action includes the notification of a government official, if required.
4. Contain the spill or environmental hazard, as per its nature, and as per the advice of the Spill Line as required.
5. Implement any necessary clean-up or remedial action.

### 5.3 Mitigative Measures

In the event of a spill:

1. Ensure your own safety and that of others around you, beginning with those nearest to the scene.
2. Control danger to human life, if necessary.
3. Identify the source of the spill.
4. Assess whether the spill can be readily stopped.
5. Immediately notify the Site Supervisor.

6. Contain or stop the spill at the source, if possible, by following these actions:
  - a) If transfer of fuels is in progress, STOP AT ONCE.
  - b) Close or shut off valves.
  - c) Place plastic sheeting at the foot of the tank, barrel, or piece of equipment to prevent seepage into the ground or runoff of fuel.
  - d) Use absorbent materials (sheets, pads, booms) to absorb and contain the spill.
  - e) Use a patch kit to seal leaks, if practical to do so.

## 5.4 Spills on Land

“Land” may be defined as soil, gravel, sand, rock, and vegetation. Advice on spill containment and clean up may be obtained from the 24-Hour Spill Line.

### 5.4.1 Procedure for Spills on Soil

1. First responder or his designate obtains plastic tarp(s), absorbent sheeting, Multi Sorb or other ultra-dry absorbent and any other necessary spill containment equipment, pump, hoses, etc.
2. A berm of native soil or snow will be constructed down slope of the seepage or spill lined with a tarp.
3. The tarp will be placed in such a way that the fuel can pool for collection and removal (e.g., at the foot of the berm). If there is a large volume of spilled product, pump the liquid into spare empty drums, and dispose of product as advised by the 24-Hour Spill Line.
4. Petroleum-product sheen on vegetation may be controlled by applying a thin dusting of Multi Sorb or other ultra-dry absorbent to the groundcover.
5. Contact the 24-Hour Spill Line. Receive instructions from the appropriate contact agencies regarding collection of the contaminated soil and/or vegetation, its removal and site clean-up/restoration.

### 5.4.2 Procedure for Spills on Snow

By its nature, snow is absorbent, and fuel spilled on snow can be collected with relative ease, either by shovel, in the case of small-range spills, or by loader, in the case of more extensive spills. Procedure for spills on snow:

1. Assess the nature of the spill. Necessary equipment might include shovels, plastic tarp(s), empty drums, and wheeled equipment.
2. Shovel or scrape contaminated snow and deposit in empty refuge drums. If the spill is more extensive build berms with compacted snow, or other suitable material, covered with plastic around the affected area.
3. Either during or immediately after the incident, notify the 24-Hour Spill Line. Receive instructions on the preferred disposal method (e.g., storage in sealed drums, incineration, or deposit in a designated lined containment area on land) from the appropriate agencies.

## 5.5 Material-specific Spill Procedures

### 5.5.1 Procedure for Diesel Fuel Spill

1. Initial Response: The Site Supervisor, or their designate, will be advised of the incident and a response initiated. ELIMINATE ignition sources and any open flame. STOP the flow of product. CONTAIN the flow of spill by berm construction with earth or other barrier, blocking any entry to waterways, construction of an interceptor trench or underflow dam, etc. If any spill has reached natural waters, deploy a containment boom, and apply absorbent materials. The spill report will be filed with the 24-hour Spill Line by the Site Supervisor or their designate.
2. Recovery: Recover as much free product as possible by pumping into drums or portable tanks. Excavate any contaminated soils/snow and containerize for future dispose of at an approved site.
3. Fire Response: Use CO<sub>2</sub>, dry chemical, foam, or water spray (fog). Use water to cool tanks. Divert the fuel to a secure area for controlled burning. If diesel fuel is escaping, get it contained as soon as possible.
4. Properties: Chemical composition hydrocarbon C9 to C16. Clear to yellow with hydrocarbon odour. Diesel fuel will float on water. Flash point of diesel fuel is >52°C.
5. Environmental Concerns: Diesel fuel is toxic to fish and other aquatic organisms and harmful to waterfowl. Start as close to the spill as possible and as up-stream as possible to prevent it from reaching streams or ponds or lakes or the ocean.
6. Personal Protection: Wear impervious chemical resistant clothing, gloves, footwear, and goggles. For confined spaces Self-Contained Breathing Apparatus (SCBA) would be required. Avoid contact with strong oxidizers such as sulphuric acid and peroxides.

### 5.5.2 Procedure for Gasoline Spill

1. Initial Response: The Site Supervisor, or their designate, will be advised of the incident and response initiated. ELIMINATE ignition sources and any open flame. REMOVE all personnel not involved with the incident from the area. STOP the flow of product. CONTAIN the flow of gasoline by berm construction with earth or other barrier, blocking any entry to waterways, construction of an interceptor trench or underflow dam, etc. If spill has reached natural waters, leave to evaporate. Gasoline contains benzene, a suspected carcinogen. Avoid breathing vapours, and if necessary, obtain an organic vapour cartridge full-face piece respirator or wear SCBA. The Spill Report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.
2. Recovery: Conduct regular explosive atmosphere monitoring with an intrinsically safe instrument. Recover as much free product as possible by pumping into drums or portable tanks.

Free product recovery operation should utilize an explosion proof pump and all equipment involved in the transfer must be properly grounded. Excavate any contaminated soils/snow and dispose of at an approved site. When excavating gasoline-contaminated soils/snow, consider using a layer of compression foam to reduce the potential of explosion arising from sparks caused during excavating.

3. Fire Response: Use CO<sub>2</sub>, dry chemical, foam, or water spray (fog). Use water to cool tanks. Divert the gasoline to a secure area for controlled burning (upon approval). If gasoline is escaping, get it contained as soon as possible.
4. Properties: Chemical composition hydrocarbon C4 to C12 range. Light green, clear, amber colour liquid with hydrocarbon odour. Gasoline floats on water. Gasoline has a Flash Point of -40°C. Vapours and product are highly flammable and explosive. Vapours are heavier than air.
5. Environmental Concerns: Gasoline is toxic to fish and other aquatic organisms and harmful to waterfowl. Start as close to the spill as possible and as up-stream as possible to prevent it from reaching streams or ponds or lakes or the ocean.
6. Containers: Gasoline being transported to the sites by air must be in 205 L drums.
7. Personal Protection: Wear impervious chemical resistant clothing, gloves, footwear, and goggles. For confined spaces SCBA will be required. Eliminate all sources of ignition. Restrict access and work upwind from spilled product. Avoid contact with strong oxidizers such as sulphuric acid and peroxides

### 5.5.3 Procedure for Aviation Fuel Spill

1. Initial Response: The Site Supervisor, or their designate, shall be advised of the incident and response initiated. ELIMINATE ignition sources and any open flame. REMOVE all personnel not involved with the incident from the area. STOP the flow of product. CONTAIN the flow of aviation fuel by berm construction with earth or other barrier, blocking any entry to waterways, construction of an interceptor trench or underflow dam, etc. If spill has reached natural waters, leave to evaporate. Aviation fuel contains naphthalene a suspected carcinogen. Avoid breathing vapours, and if necessary, obtain an organic vapour cartridge full-face piece respirator or wear SCBA. The Spill Report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.
2. Recovery: Conduct regular explosive atmosphere monitoring with an intrinsically safe instrument. Recover as much free product as possible by pumping into drums or portable tanks. Free product recovery operation should utilize an explosion proof pump and all equipment involved in the transfer must be properly grounded. Excavate any contaminated soils/snow and dispose of at an approved site. If spill has reached natural waters, leave to evaporate. When excavating aviation fuel-contaminated soils/snow, consider using a layer of compression foam to reduce the potential of explosion arising from sparks caused during excavating.

3. Fire Response: Use CO<sub>2</sub>, alcohol-resistant foam, dry chemical methods. Use water to cool tanks. Do not allow run-off from firefighting to enter drains or water courses. If aviation fuel is escaping, get it contained as soon as possible.
4. Properties: Chemical composition is primarily kerosene (hydrocarbon C9 to C16 range) and naphthalene. Clear, light yellow coloured liquid with hydrocarbon odour. Aviation fuel floats on water and has a Flash Point of -37.8°C. Vapours and product are highly flammable and explosive. Vapours are heavier than air.
5. Environmental Concerns: Aviation fuel is toxic to fish and other aquatic organisms with long lasting effects and harmful to waterfowl. Start as close to the spill as possible and as up-stream as possible to prevent it from reaching streams or ponds or lakes or the ocean.
6. Containers: Transported to the sites by air and stored in 205 L drums.
7. Personal Protection: Wear impervious chemical resistant clothing, gloves, footwear, and goggles. For confined spaces SCBA will be required. Eliminate all sources of ignition. Restrict access and work upwind from spilled product. Avoid contact with strong oxidizers such as sulphuric acid and peroxides.

#### 5.5.4 Procedure for Lubricating or Hydraulic Oil Spill

1. Initial Response: The Site Supervisor, or their designate, will be advised of the incident and response initiated. ELIMINATE ignition sources and any open flame. STOP the flow of product. CONTAIN the flow of oil by berm construction with earth or other barrier, blocking any entry to waterways, construction of an oil interceptor trench or underflow dam, etc. If spill has reached natural waters, apply oil absorbent materials to the water surface. The spill report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.
2. Recovery: Recover as much free product as possible by pumping into drums or portable tanks. Excavate any contaminated soils/snow and dispose of at an approved site. Use absorbent pads or granular absorbents for minor spills.
3. Fire Response: Use CO<sub>2</sub> dry chemical, foam, or water spray (fog). Water may spread fire. Use cool water to cool containers. Divert the oil to a secure area and allow to burn under control. If oils are escaping, get it contained as soon as possible. Wear SCBA and eye protection.
4. Properties: Chemical composition mixture of hydrocarbons and conventional industrial oil additives C22 to C61 range. Light and dark amber colours with hydrocarbon odour. Floats on water. Flash Point 190°C to 215°C.
5. Environmental Concerns: Lubricants and hydraulic oil are toxic to fish and other aquatic organisms, harmful to waterfowl. Lubricants and hydraulic oil will foul riverbanks, shorelines, etc.

6. Containers: Transported to the sites in 205 L drums and transferred to the new garage locations at the site.
7. Personal Protection: Wear impervious chemical resistant clothing, gloves, footwear, and goggles. The use of an organic cartridge respirator will not likely be required. Avoid contact with strong oxidizers such as sulphuric acid, bleaches, and peroxides.

#### 5.5.5 Procedure for Waste Oil Spill

1. Initial Response: The Site Supervisor, or their designate, will be advised of the incident and response initiated. ELIMINATE ignition sources and any open flame. STOP the flow of product. CONTAIN the flow of oil by berm construction with earth or other barrier, blocking any entry to waterways, construction of an oil interceptor trench or underflow dam, etc. If spill has reached natural waters, apply oil absorbent materials. The spill report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.
2. Recovery: Recover as much free product as possible by pumping into drums or portable tanks. Excavate any contaminated soils/snow and dispose of at an approved site. Waste Oil spilled on water will be recovered by using skimmers or absorbent booms. Use absorbent pads or granular absorbents for minor spills.
3. Fire Response: Use CO<sub>2</sub> dry chemical, foam, or water spray (fog). Water may spread fire. Use cool water to cool containers. Divert the oil to a secure area and allow to burn under control. If oils are escaping, get it contained as soon as possible. Wear SCBA and eye protection.
4. Properties: Chemical composition mixture of hydrocarbons and conventional industrial oil additives C22 to C66 range. Black and brown colours with hydrocarbon odours. Waste oil floats on water. Waste oil has a Flash Point of 100°C to 200°C.
5. Environmental Concerns: Waste oil is toxic to fish and other aquatic organisms, harmful to waterfowl. Waste oil will foul riverbanks, shorelines, etc.
6. Containers: Transported by air and transferred to various storage locations at the site. Products stored in various size containers up to 205 L.
7. Personal Protection: Wear impervious chemical resistant clothing, gloves, footwear, and goggles. The use of an organic cartridge respirator will not likely be required. Avoid contact with strong oxidizers such as nitric acid, sulphuric acid, chlorine, and peroxides.

#### 5.5.6 Procedure for Antifreeze Spill

1. Initial Response: The Site Supervisor, or their designate, shall be advised of the incident and response initiated. ELIMINATE ignition sources and any open flame. STOP the flow of product. CONTAIN the flow of antifreeze by berm construction with earth or other barrier, blocking any entry to waterways, construction of a interceptor trench or underflow dam, etc. The spill report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.

2. Recovery: Small spill or leak: Dilute with water and mop up or absorb with an inert DRY material and place in an appropriate waste disposal container. Large spill or leak: Absorb with an inert material and put the spilled material in an appropriate waste disposal. Dispose of in accordance with regional regulations.
3. Fire Response: While antifreeze isn't highly flammable under normal circumstances, it can be flammable under specific conditions and its components, like ethylene glycol, are combustible. For small fires - use dry chemicals, CO<sub>2</sub>, foam, or water spray (fog). Large fires – use water spray, fog, or foam. DO NOT use water jet on large fires. Water may spread fire. Use cool water to cool containers. Divert the oil to a secure area and allow to burn under control. If oils are escaping, get it contained as soon as possible. Wear SCBA and eye protection.
4. Properties: Chemical composition usually a mixture of ethylene glycol and sodium tetraborate pentahydrate. Transparent viscous liquid, coloured. Odourless. Soluble in water. Flash Point 116°C. Reactive with oxidizing agents, acids, and alkalis.
5. Environmental Concerns: Ecological information not available in MSDS, however ethylene glycol is extremely dangerous in case of ingestion in humans, and other animals. Start as close to the spill as possible and as up-stream as possible to prevent it from reaching streams or ponds or lakes or the ocean.
6. Containers: Transported to the sites in drums and transferred to various vehicles at the site. Products stored in various locations.

#### 5.5.7 Procedure for Propane Spill

1. Initial Response: The Site Supervisor, or their designate, shall be advised of the incident and response initiated. IMMEDIATELY EVACUATE all personnel from danger area as propane is extremely flammable in the presence of open flames, sparks, and heat. ELIMINATE ignition sources and any open flame if safe to do so. STOP the flow of product if safe to do so. VENTILATE the area if safe to do so. Wear SCBA if needed. The Spill Report will be filed with the 24-hour Spill Line by the Site Supervisor or his designate.
2. Recovery: N/A. If the gas has not ignited, liquid or vapour may be dispersed by water spray or flooding.
3. Fire Response: Use firefighting measures that are appropriate to the local circumstances and the surrounding environment. CO<sub>2</sub> or dry chemical can be used. Use water to cool cylinders. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. If product release cannot be shut off safely, allow the product to burn itself out. Container metal shells require cooling with water to prevent impingement and the weakening of metal. If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated.

4. Properties: Colourless liquid and vapour while stored under pressure. Commercial propane has an odourant added which gives an odour like boiling cabbage when in its natural gaseous form. Propane has a flash point of  $-103.4^{\circ}\text{C}$ . Vapours and product are extremely flammable and explosive. Vapours are heavier than air. Reactive with oxidizing agents and halogenated compounds.
5. Environmental Concerns: Simply asphyxiant at sufficient concentrations. Otherwise, no data available.
6. Containers: Transported to the site by air and stored in cylinders (100lb).
7. Personal Protection: Wear impervious chemical resistant clothing, insulated gloves, footwear, and goggles. For confined spaces SCBA may be required. Eliminate all sources of ignition. Restrict access and work upwind from spilled product.

## 6.0

## Resource Inventory

## 6.1

### Personal Protective Equipment

All NOJV and ATCO personnel will be supplied with the appropriate Personal Protective Equipment (PPE) for the tasks and duties being performed. Personnel will be trained and competent in the use, maintenance, wearing and inspection of their PPE.

Training for the handling, storage and disposal of contaminated PPE will be delivered on site and documented accordingly. Access to shower facilities, potable water and suitable sanitation facilities will also be addressed on site. Decontamination procedures and training will be established in collaboration with the camp manager.

All personnel working under NOJV and ATCO will, at a minimum, wear the following PPE while onsite (i.e., designated work areas):

- Hard Hat
- Steel Toed Boots
- High Visibility Equipment

The following PPE must be worn for specific tasks (based on hazard assessment and applicable Safe Work Procedures):

- Safety Glasses
- Sturdy Gloves and thin disposable gloves
- Respirator
- Tyvek Suits
- Fall Protection
- Hearing Protection

## 7.0

## Spill Materials Inventory

Spill kits will be located throughout the site. Small spill kits and mobile spill response kits will be located on the heavy equipment and large spill kits will be in the designated incineration area, wastewater storage area and the camp. Spill kit contents and available heavy equipment are listed below.

## 7.1

### Small Spill Response Kits

- 208 L container
- (50) Absorbent Pads (Oil, Gas & Diesel)
- (4) 3" x 12' Absorbent Socks (Oil, Gas & Diesel)
- (8) Absorbent Pillows (Oil, Gas & Diesel)
- (1) Pair of Nitrile Gloves
- (1) Emergency Handbook
- (1) Pair of Goggles
- (5) HD Hazmat Disposal Bags

## 7.2

### Mobile Spill Response Kits

- (1) Shovel, and
- (1) Spill kit (20L)

## 7.3

### Large Spill Response Kit

- 390 L container
- (110) 15" x 19" Absorbent Pads (Oil, Gas & Diesel)
- (12) 3" x 4' Absorbent Socks (Oil, Gas & Diesel)
- (8) 3" x 12' Absorbent Socks (Oil, Gas & Diesel)
- (8) 18" x 18" Oil Absorbent Pillows
- (1) Pair of Nitrile Gloves
- (1) Emergency Handbook
- (1) Pair of Goggles
- (10) HD Hazmat Disposal Bags

## 7.4

### Heavy Equipment Available

- Kubota R520 Loader
- Komatsu WA 180 Loader
- Cat D7 Dozer

## **Appendix A**

### ***Standard Operating Procedure***

# Incinerator Operating Procedure, Isachsen HAWS

NOJV SOP:

Ver: 1

Issue Date: Nov. 27, 2024

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# Incinerator Operating Procedure, Isachsen HAWS

## 1.0 SOP Introduction

### 1.1 Purpose Statement

The purpose of this Standard Operating Procedure (SOP) is to describe the steps required to safely operate the two Ketek incinerators 9570A and 9570B stored at Isachsen HAWS and to provide a reference for setup and disassembly of these incinerators.

At the end of this SOP, the user will be able to:

1. Setup incinerators 9570A and 9570B
2. Safely operate the incinerators
3. Identify common incineration issues and solutions
4. Properly disassemble and safely store incinerators 9570A and 9570B

### 1.2 Intended User of this Document

This SOP is intended for any person tasked with operating or assisting in incinerator operations.

### 1.3 Who are the Participants

#### 1.3.1 Assignee:

The project manager or field superintendent role will indicate if an employee is required to operate or assist in operation of incinerators. They will direct the employee to read over the SOP. They will also be responsible for selecting the incineration area and empty drum storage locations

#### 1.3.2 Assigned:

The employee assigned to help setup, disassemble, monitor, and or assist in the incineration of fuel via incinerator 9570A or 9570B.

### 1.4 Applicable Industry Standards or Required Certifications

- No standards are required for the current SOP.
- Understanding the signs of a spill or fuel line leak

### 1.5 List of Minimum Required Equipment for this Process

- A forklift or fork equipped vehicle
- Waste fuel
- Clean diesel fuel for pilot burner ignition and/or operation
- A fuel storage/mixing tank
- A clear storage tank for oily water fuel separation
- Personal hand radio or communications device for safety and spill reporting

# Incinerator Operating Procedure, Isachsen HAWS

- Portable secondary fuel containment capable of holding 110% volume discharge from the largest fuel storage/mixing tank
- Spill kit(s)
- Min 8000 watt generator: Capable of outputs Voltage: 125/250VAC, Phase: 1PH, Amp: 30, Freq: 60Hz)
- Incinerator components (see attached Incinerator Setup figure at the end of the SOP)

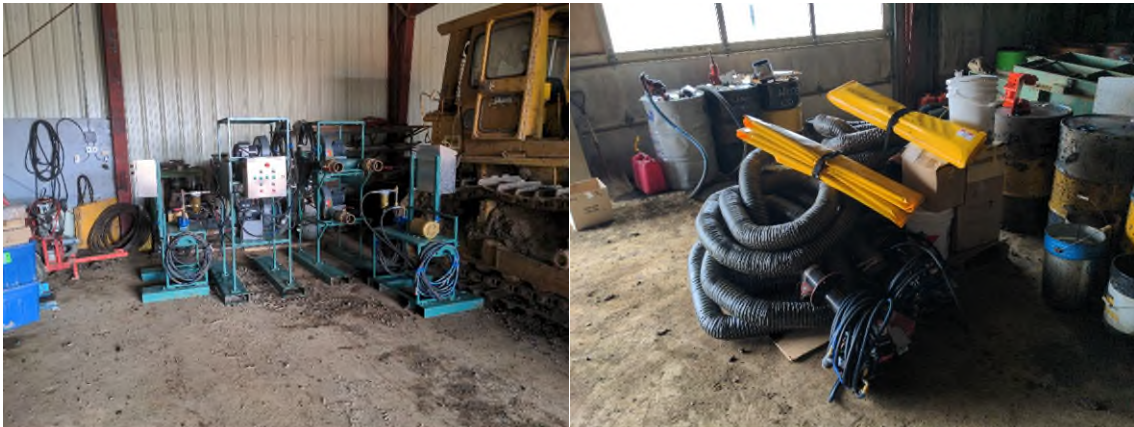
## 2.0 Incinerator Setup/Disassembly

### 2.1 Storage Locations of Incinerator Components:

The incinerator components are stored in the following locations:

1. In the New Garage near the back south wall are the main control panels, and waste fuel control panels. To the east of the bay doors, are the pilot burners air intake hoses, portable spill containment berms, fittings, spare chamber cement, and some additional pails (Figure 1 below).

*Figure 1: New Garage - Incinerator Components Storage Location*



2. To the east of the Runway Tanks are the two incineration chambers (Figure 2 below).  
**Note: The storage locations may change from year-to-year. Any change in storage locations for the components should be documented at time of disassembly.**

# Incinerator Operating Procedure, Isachsen HAWS

Figure 2: Near Runway Tanks - Incineration Chamber Storage Location



3. For future incineration operations, mixing tanks, a spill containment berm, oily water fuel separation totes, generators and clean diesel fuel will be found.

**Note: These items have not yet been mobilized to site yet. These components should be stored in the New Garage for long term storage and documented along with the rest of the incinerator parts following incineration operations.**

## 2.2 Setup:

The following steps will detail how to setup the incinerators as per the Incinerator Setup figure provided in **Appendix A** of this SOP.

**Note: The use of rig mats to prevent ground rutting is advised as Isachsen can be extremely muddy and repeated vehicle traffic can quickly make the ground condition horrendous.**

1. Using a fork-equipped vehicle move all the incinerator parts to the designated incineration area chosen by the project manager or field superintendent. Use rig mats wherever possible to prevent ground rutting as noted above.

**Note: The exact incinerator location may vary but the incineration chambers must have a clear 6 meter radius around due to the high operating temperature.**

The main incinerator components are shown below in Figure 3 for reference.

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Figure 3: Main Control Panel with attached blowers (left), Waste Fuel Pump Control Panel, pump attached (middle left), Incineration chamber (middle right) and Pilot Burner (right)



Figure 4: Clean Diesel and waste fuel for pilot burners (left), Proposed Mixing Tank (middle left), proposed oily water fuel separation tote (middle right) and proposed Field Generator (1 required for each incinerator setup) (right)



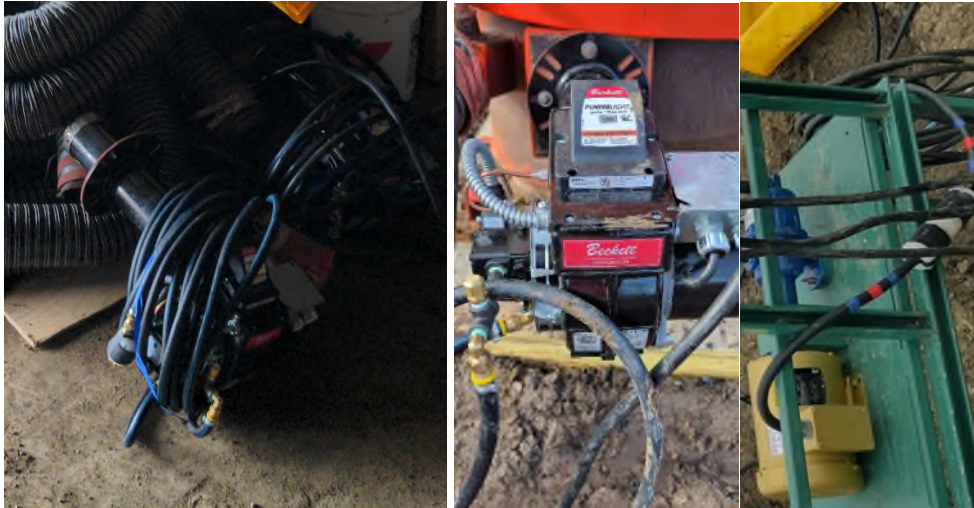
2. Setup the spill containment berm(s) as needed. Position all the fuel containing tanks/totes inside the berm using the fork-equipped vehicle. The spill containment berm must contain 100% of the volume in the largest mixing tank as well as an additional 10% of the total fuel volume contained within the berm. See **Appendix A** for the Incineration Setup with the spill containment arrangement shown.
3. Arrange the other non-fuel containing control panels and incineration chambers as illustrated with consideration for the incineration chambers to have a 6-meter clear radius.
4. Install the pilot burners on the incineration chambers. First mount the pilot burner to the burn chamber using the bolts found within one of the Canadian Tire 5 G pails used for incineration parts located in the New Garage. The fuel line of the pilot burner should then be connected to a clean diesel source. The power cord from the pilot burner attaches to the main control panel.

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Complete this step for both incineration chambers. There is a spare pilot burner within the New Garage in case one pilot burner fails.

**Note: The power lines are labelled and colour coated with electrical tape, the ends of the same colour and label should be connected together.**

*Figure 5: Unattached pilot burner (left), attached pilot burner (middle), Example of colour coated power connections (right)*



5. Setup of the waste fuel control panel. The waste fuel panel comes pre-attached with a fuel pump and filter. The intake line of the pump should be submerged/connected to the fuel mixing tank and output connected just left of the pilot light on incineration chamber (Figure 6 below). Use some plumbers tape on the fitting to prevent leakage. Lastly, connect the power line and data line to the main control panel in the same manner as 2.2 Setup Step 4 above.

*Figure 6: Waste fuel connection valve on incineration chamber*



6. Setup of the main control panel. Two blowers come pre-attached to the control panel. There are three air hoses and 12 gaskets and hose clamps (see Figure 7 below) used for operation. The upper blower contains a hose splitter for evenly distributing airflow between two air lines and

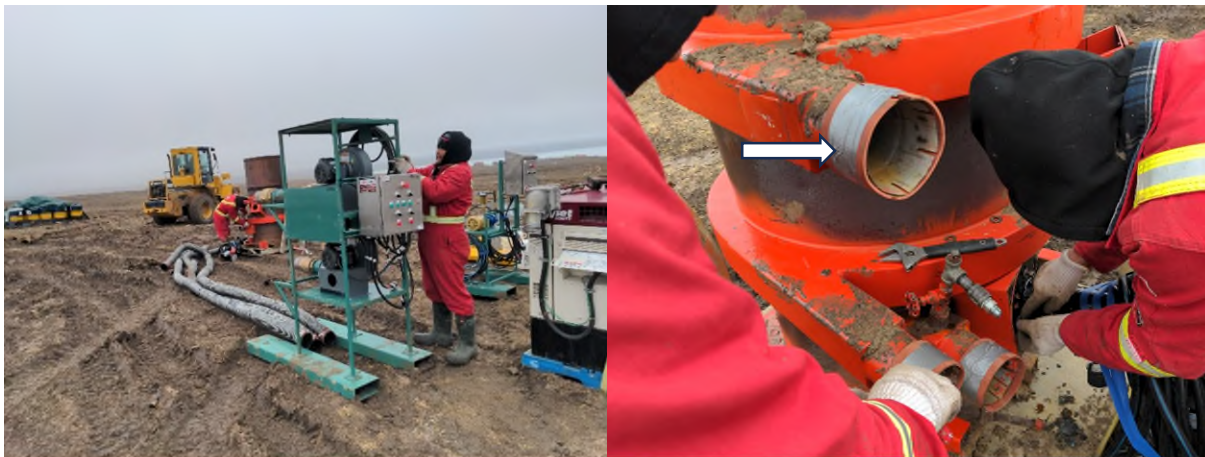
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these air lines connect to the two top air connections on the incinerator chamber. The air hose from the bottom blower connects to the bottom air connection on the incineration chamber. When connecting the air hoses, place the air hoses over the gaskets then use the padded hose clamps to tighten down the connection.

**Note: The air hoses are quite fragile and there are no extra currently on site. Do not over tighten the hose clamps. Just tighten them enough to keep the hose from sliding off the connection port.**

7. Lastly connect the remaining power line to the generator. This is the only power cord that is labelled but uncolored.

*Figure 7: Main control panel, and uninstalled incineration hoses (left), Air hose gaskets on incineration chambers air connections (right)*



At this point everything should be connected as per the Incinerator Setup Diagram provided in **Appendix A**.

## 3.0 Incinerator Operation:

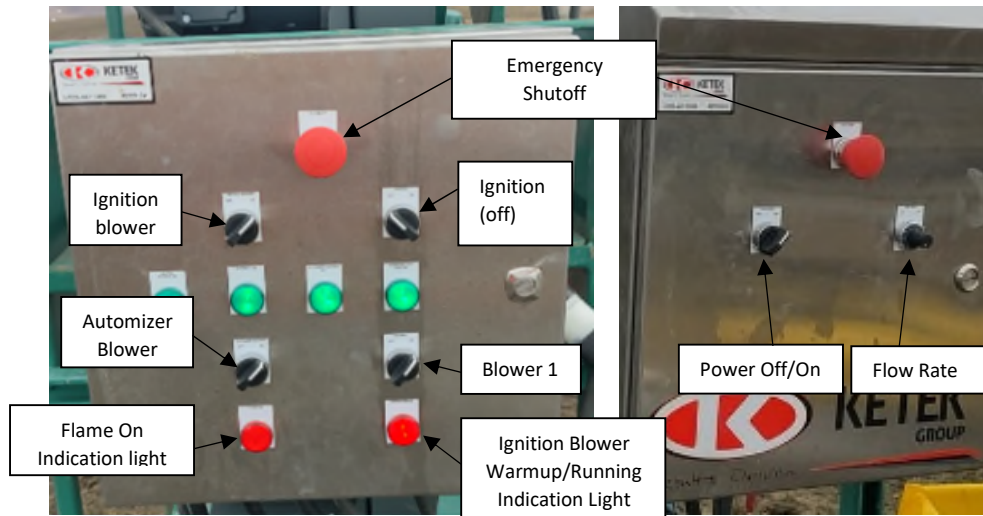
### 3.1 Startup:

The following steps describe how to properly commence the incineration of waste fuels. The incineration rate for waste fuels is 113 Liter per hour and the burn rate for the pilot burner is 16 Liter per hour. See the main control panel figure below for switch reference.

**Note: When a switch is pointed to the left it is off. For example, the ignition switch is off in the photo (left) below.**

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Figure 8: Control Panel Switch Layout. On/Off Indicator Lights in green. Main panel (left) waste fuel panel (Right)



1. Check all fuel, air and electrical lines for damage and ensure all connections are good prior to starting the incineration process.
2. Make sure the generator is topped up with fuel and that the emergency stop buttons on the main control and waste fuel panel are disengaged.
3. Turn the generator on.
4. Turn on the ignition blower switch on the top left of the control panel. This will start the pilot burner by providing a small amount of fuel & turning on the pilot burners built in blower.
5. Wait five minutes for the pilot burner to begin circulating air and fuel within the incineration chamber. During this time check for leaks in the fuel line that may be caused by the pilot burner startup.
6. After five minutes a red light on the bottom right corner will turn on. The ignition switch on the top right can now be switched on this will increase flame output of the pilot burner to an operational state.
7. Confirm that the flame has been lit. You should see hot air rising from the ignition chamber and maybe some steam.
8. Wait for 30 minutes to allow the burn chamber to heat up.
9. Now turn the Blower 1 switch on. Check to make sure the blower is operating properly then immediately turn on the Automizer Blower switch.
10. The waste fuel control panel will now be activated. Go over to the waste fuel panel and turn the switch on. Start at the lowest setting (flow rate) and adjust the fuel flow rate nob until the flame is just barely visible as seen in the Figure 9 photo below. This is the maximum flame height and incineration should be stopped if the flame goes too high above the chamber top while at the lowest flow rate.
11. If the fuel appears to be burning well, the incineration is self-sustaining and the ignition switch on the main control panel can and should be switched off to save burning the 16 liters per hour of clean diesel for the pilot burner.

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**Note: If turning the ignition switch off causes the flame to go out within the next few minutes it should immediately be turned on again.**

*Figure 9: Waste fuel pump and control panel and burn chamber with ideal flame height shown*



## 3.2 Shutdown/Cooldown:

The following steps describe the shut down procedure and the mandatory cool down period for the incinerators:

1. Turn the flow rate dial on the waste fuel control panel to the minimum setting.
2. Turn the waste fuel control panel off using the on/off switch.
3. Turn off the ignition on the main control panel. There should now no longer be any flame in the incineration chamber.

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4. For the next three hours allow the incineration chamber to cool by keeping the Blower 1, Automizer Blower and the Ignition blower switches on.
5. After three hours look for signs that the ignition chamber has cooled and the turn of all switches.

## 3.3 Troubleshooting:

Here is a list of some common issues that may occur and steps to rectify them:

### Stoppage of Main Incineration Flame:

1. Firstly, always check that all the fuel line are securely connected and the waste fuel and clean diesel tanks and generator fuel supply are filled up. This is always the first thing to check. If any one of these fuel sources runs dry it could cause damage to the system.
2. If the incineration flame goes out while the ignition switch is off, this may be caused by oily water getting in to the waste fuel line or caused by fuel that is not combustible enough.

Rectify by turning the waste fuel control panel off temporarily and turning the ignition switch back on. Wait until you see the flame again and then start the waste fuel control panel again, try to continue burning with the ignition on for a few minutes before attempting to turn it off again. If the flame goes out again, continue burning with the ignition switch turned on until a point where new waste fuel can be mixed.

3. If the incineration flame goes out while ignition switch is on, this may be caused by oily water getting into the waste fuel line or a damaged pilot light.

Rectify by first turning off the waste fuel pump on the control panel. Check that the power line is connected to the main control panel. If the flame doesn't reappear within a minute, you may have a pilot burner failure. Cool down the incineration chamber and then install the spare pilot burner. If the flame does come back on, try starting the waste fuel control panel again. If the waste fuel puts out the flame with the ignition burner running, then there is probably a high amount of oily water attempting to be burned. Try putting the waste fuel line into another mixing tank or more known combustible waste fuel product. If this solves the problem, pump the product out of the problematic mixing tank into a oily water separation tank and see if more fuel will decant out of the mixture. Try burning the fuel portion again.

If there is dark smoke coming from the incineration chamber:

1. The waste fuel supply line may need to have the particulate filter replaced or one of the blowers may not be operating properly and providing enough air to the system.

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Rectify by first turning off the waste fuel control panel. Check the blower for power and any malfunction. If there is a malfunction, stop incineration until the blower can be fixed or replaced. If the blowers are operating correctly, empty the contents of the filter into a bucket and recirculate it back into the mixing tank. Replace the filter and proceed. If black smoke persists, try decreasing the flow rate and turning the incinerator switch on. If nothing rectifies the issue, try a new fuel mixture and slowly use the problematic fuel to dilute other known pure fuel types. Or dispose of that mixed batch of waste fuel by other means than incineration.

## 4.0 Fuel Mixing

### 4.1 Oily Water & Fuel Separation:

The oily water & fuel separation process will be used to aid in the mixing of fuels with the goal to reduce water content making for favorable incineration conditions. The incineration system/process can operate with as much as 10% water content, and as long as a flame can be maintained while the ignition flame is running this shouldn't cause a problem.

To reduce the water, mixed/unknown fuels should be placed in a separate clear plastic tote and given 45 minutes for the fuel to decant from the water. There should be a visible floating phase of fuel above the water in the separation tote. Draw off the floating phase and put it into the incinerator mixing tanks for incineration. Pump the remaining oily water into a storage container. The water fraction will have to be either cleaned / treated on-site and tested to confirm that it meets surface water quality guidelines prior to releasing it on site, or sent off-site for disposal.

**Note: Try not to exceed 10% volume of the oily water within the mixing tank. Use the fuel product inventory provided to help determine mixing ratios and avoid incineration down time.**

*Figure 10: Fuel and Water separation in a glass*



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### 4.2 Volatile Fuel (Gasoline) Mixing:

Gasoline is too volatile for direct incineration within the system and will cause the flame to protrude out of the incineration chamber creating unnecessary safety risks. Gasoline should be mixed down to a 5% gasoline mixture with 95% diesel or jet fuel ratio (i.e. 1 part to 19). This ratio of gasoline to diesel/jet can be varied as long as the flame is kept under the maximum height. Use the fuel product inventory to help determine mixing ratios and avoid incineration down time.

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SOP Author / Date / Version #

Eric Grimminck/Nov 27 2024/#1

Peer Review / Date / Version #

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